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THE GALAPAGOS ISLANDS*

By GEORGE McCUTCHEON McBRIDE

The Galapagos Islands, sometimes called "The Haunted Isles" (Las Islas Encantadas) and in 1892 officially renamed the "Archipiélago de Colón" in honor of Columbus, lie astride the equator, about 600 miles off the coast of Ecuador and 850 miles southwest of Panama.

Discovery

They were discovered in 1535, twenty-two years after Balboa first sighted the waters of the South Sea and three years after Pizarro had overthrown the Inca Empire. Tomás de Berlanga, third bishop of Panama, was the discoverer. While sailing from the isthmus for the newly conquered Peru, he was becalmed and carried by ocean currents far out from shore. Short of water and with the supply of feed for the horses on board almost exhausted, the navigators landed on an island toward which the ocean drift had carried them. They found little water or forage but saw great numbers of large land turtles (Spanish, *galápagos*) big enough to carry a man on their backs.

Names

The discoverers gave no name to the islands; but, because of the abundance of turtles found by subsequent visitors, the group soon came to be known among the Spaniards as the Islands of the Galapagos. Such names as Santa Gertrudis, Tierra de Carlos IV, Quita Sueño (nightmare), etc., were given to the individual islands. The archipelago was entirely uninhabited when discovered and remained so for 300 years. During the sixteenth and seventeenth centuries it was a favorite rendezvous of the buccaneers, who found the islands conveniently situated as a base from which to raid the Spanish towns of the west coast and to which they could return for the division of the spoils. These adventurers gave names of their own to the different islands, calling them after personages prominent in English history of their time; Chatham, Albemarle, James (Stewart), Charles (Stewart), Narborough, etc. Both former sets of names have been replaced by the Ecuadorian government, which has rechristened the group, using names of those connected with the discovery of America. So we find in official publications that the islands are now styled San Cristóbal, Santa

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* The suggestion for this article came from an account of a voyage to the Galapagos Islands made in 1906-07 by Señor don Nicolás G. Martínez, formerly of the Observatory of Quito, Ecuador. This account was first published in full in 1916 in 23 numbers of *El Telégrafo* of Quito, two extracts having appeared previously in *La Prensa* of Ambato, Ecuador, in 1911 and 1913 respectively. Dr. John Kunst of Chicago, Ill., made a translation of the entire account and sent it with the translation to the Editor of the *Review*. It has been used in part as the basis for the present study.

María, Pinta, Pinzón, Isabela, Fernandina, etc. The English names, however, have persisted, and by them the islands are most widely known.

EARLY HISTORY

The first official exploration of the Galapagos was undertaken in 1793 by Alonzo de Torres of the Royal Spanish fleet. After a hasty visit to the islands, lasting only a few days, a map of the group was made.[1] As the Galapagos lay far off the routes followed by ships sailing the Pacific they were of little interest until the beginning of the nineteenth century. At that time citizens of the United States brought them to the fore. American whalers, having largely exhausted the Atlantic Ocean grounds, began to voyage farther in search of hunting fields. This was the period when the presence of their rich cargoes in the Falkland Islands offered a tempting opportunity to tax them, and it was only after an American man-of-war had destroyed the customhouse there that the attempt was given over. About this time the whalers began to round Cape Horn. Ports of Chile and Peru were now frequented by American whalers. Their harbors, where today the Stars and Stripes are seldom seen, were often filled with schooners carrying the American flag. These Pacific Ocean whale hunters found the Galapagos Islands a convenient gathering place. Sperm whales were abundant in the vicinity, and on these uninhabited islands food and fuel could be secured with little trouble. One of the harbors on the Island of Charles where drinking water (very scarce on most of the islands, entirely lacking on some) was found, still bears the name then given it, of Post Office Bay. There the whalers had arranged a place in which to deposit letters brought by vessels recently arrived or from which homeward bound ships could collect any mail left.

AS POSSESSIONS OF ECUADOR

In 1831 an Ecuadorian, Gen. José Villamil, after investigating conditions in the islands, called the attention of his government to them, and the following year, apparently for the sake of securing revenue from the whalers or because of a fear lest an unclaimed group of islands which were assuming such importance might pass into foreign hands, Ecuador sent out a small expedition under Col. Ignacio Hernández, who, on February 12, called together the crews of the whaling ships then at the Island of Charles and in their presence formally took possession of the archipelago in the name of his government. A little colony was established near the harbor. A few acres were tilled though trade with the American whaling men was the main support of the colonists, who, in 1837, numbered some 200 or 300 people.

But the island soon was made a penal settlement, a step which destroyed all hopes of prosperous development; and by 1854, when American whale fishing began to decline, the tiny colony had been reduced to a few members and extreme poverty. Distance from the seat of government, too, had made administration difficult. There had been frequent revolts. Two governors had been assassinated and one driven from the islands. Consequently when, in 1852, Great Britain proposed to accept the islands in lieu of a debt due from the Ecuadorian government there was little opposition in Quito. But Peru, France, and Spain protested against this transfer and negotiations came to nought. Just at this time an American whaling crew which had put into Post Office Bay were captured by the convicts and their ship employed as a means of escape to the mainland. The United States, in exacting damages in behalf of its aggrieved citizens, made an effort (1854) to secure a concession for the exploitation of the guano said to abound on some of the islands. This time England joined with the former obstructionists in blocking proceedings.

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[1] See J. A. Bognoly and J. M. Espinosa: Las Islas Encantadas, Guayaquil, 1905.

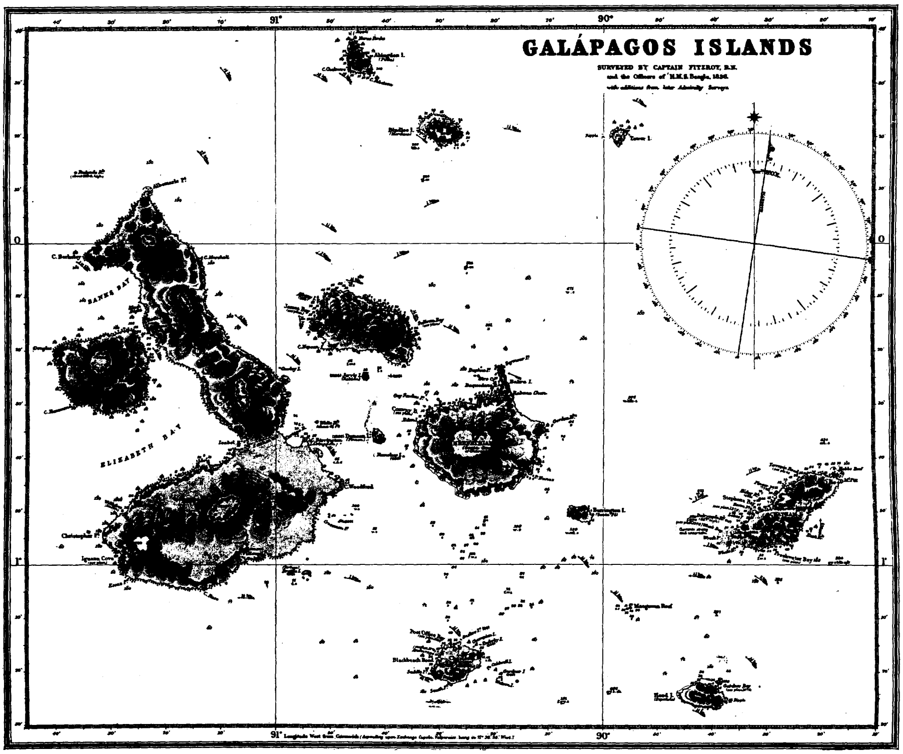
GALÁPAGOS ISLANDS
SURVEYED BY CAPTAIN FITZROY, R.N.
and the Officers of H.M.S. Beagle, 1836.
with additions from later Admiralty Surveys.
91°
90°
0
1°
Tower I.

FIG. 1—Galapagos Islands: from the British Admiralty Chart, No. 1375, published 1886. Scale of this reduction 1:2,650,000.

Once more, in 1858, the Ecuadorian government was said to have planned the lease of the islands to the United States in consideration of a loan of several millions of dollars. If such a project was considered it came to nothing and the islands continued undeveloped and almost uninhabited. Former colonists had left many domestic animals which had grown wild and had increased rapidly. Droves of cattle, dogs, cats, pigs, and donkeys existed where the colonies had been, while flocks of goats occupied some of the lesser islands. Of later efforts at colonization none have succeeded except those now on Chatham and Albemarle. Recent unsuccessful attempts have been made by North American interests to secure concessions for the development of the natural resources, but the Ecuadorian government apparently fears that its hold on these distant possessions is too feeble to sustain the centrifugal influence of foreign colonists.

Visits of Scientists

The greatest interest in the Galapagos, however, attaches not to their history, but to the peculiarities of their geologic structure, their climate, and the unique place biologically which the group occupies. These have been the objects of attention by scientists from many lands and on repeated occasions. In 1835 when the *Beagle* visited the islands, the young scientist, Darwin, made a study of their natural history that has formed the basis of all subsequent work.[2] The Swedish botanist, N. J. Anderson, spent a few days on the islands in 1852. Later Dr. Habel, the scientists of the Hassler expedition under the direction of Louis Agassiz, Theodor Wolf[3] (as government geologist of Ecuador), Alexander Agassiz (as leader of the *Albatross* expedition), and others have investigated various phases of the natural history of the islands. The published results of these studies[4] and the accounts written by the buccaneers constitute almost the entire source of information regarding this peculiar group of islands.

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[2] Narrative of the Surveying Voyages of H.M.S. Adventure and Beagle, 3 vols., London, 1839; reference in Vol. 2, pp. 484-505. Sir J. D. Hooker's work on the flora of the archipelago, based on Darwin's collections first drew scientific attention to its peculiar character (see B. L. Robinson, work cited in footnote 4, pp. 77, 81-82).

[3] Teodoro Wolf: Geografía y Geología del Ecuador, Leipzig, 1892, pp. 469-493; *idem*: Die Galápagos-Inseln, *Verhandlungen der Gesell. für Erdkunde zu Berlin*, Vol. 22, 1895, pp. 246-265.

[4] The more recent of these include:

Alexander Agassiz: General Sketch of the Expedition of the "Albatross" from February to May, 1891, *Bull. Museum Comp. Zoöl.*, Vol. 23, 1892, pp. 1-89, Cambridge, Mass.

George Baur: On the Origin of the Galapagos, *Amer. Naturalist*, Vol. 25, 1891, pp. 217-229: 307-326; *idem:* New Observations on the Origin of the Galapagos Islands, with Remarks on the Geological Age of the Pacific Ocean, *ibid.*, Vol. 31, 1897, pp. 661-680; 864-896.

Edmund Heller: Mammals of the Galapagos Archipelago, *Proc. California Acad. Sci.*, 3d Ser., *Zoölogy*, Vol. 3, 1904, pp. 233-250.

A. L. Kroeber: Floral Relations among the Galapagos Islands, *Univ. of California Publs. in Botany*, Vol. 6, 1916, No. 9, pp. 199-220.

Robert Ridgway: Birds of the Galapagos Archipelago, *Proc. U. S. Natl. Museum*, Vol. 19, 1897, pp. 459-670.

B. L. Robinson: Flora of the Galapagos Islands, *Proc. Amer. Acad. of Arts and Sci.*, Vol. 38, 1902, pp. 77-269.

Alban Stewart: A Botanical Survey of the Galapagos Islands, *Proc. California Acad. Sci.*, 4th Ser., Vol. 1, 1911, pp. 7-283; *idem:* Further Observations on the Origin of the Galapagos Islands, *Plant World*, Vol. 18, 1915, pp. 192-200.

See also the chapter on the Galapagos Islands in R. F. Scharff: Distribution and Origin of Life in, America, New York, 1912, pp. 295-335.

VOLCANIC CHARACTER

The Galapagos Archipelago is composed of ten principal islands with many smaller ones. The largest, Albemarle (Santa Gertrudis of the Spaniards, Isabela of the Ecuadorians), measures about 75 miles in greatest length by 15 in maximum width. Some of the smaller ones are mere rocky points projecting above the surface of the water. Wolf estimates the space over which the islands are scattered as some 18,000 square miles and their combined area is a little over 2,000 square miles. There is a striking similarity in the appearance of the larger members of the group. Each island is composed of one or more central cones from which the land slopes gently to the water's edge except on the southeast side where the ocean waves, breaking constantly against the shore, have worn it back into abrupt cliffs. The summits of the islands vary in height from 1,000 to nearly 5,000 feet. Seen from a distance these higher points rise as if from separate bases, the low connecting flats appearing only on near approach. Scattered over the sloping plains from the shore to near the inland summits rise thousands of jagged secondary peaks, roughly conical hillocks, that impart a strange appearance to the landscape. The whole group is volcanic. Darwin believed that the islands were entirely oceanic in origin and that each had risen separately. This theory, supported by Wallace and Agassiz, was undisputed for many years; but Baur's study of the biology of the islands led him to the conclusion that they had formerly been joined together and at a still earlier period had been connected with the American continent.[5] The survey of the ocean topography between Central America and the Galapagos carried out by the *Albatross* expedition in 1885-91 showed the islands to be the highest points of a submarine elevation, more or less circular in form, sloping up very gradually from 1,000 fathoms below the surface. This elevation in turn is the summit of an immense submerged plateau that extends northward past Cocos Island almost to the Isthmus of Panama.[6]

The entire surface of the islands is covered with lava and volcanic ash ejected from craters in the central and secondary cones. Colnett, who visited them in 1794, speaks of Albemarle and Abingdon as "one entire clinker."[7] Over the lower lands the lava shows little effect of weathering; the plains are covered with brittle fragments; and the surface is crossed at intervals by huge streams of glassy blocks of obsidian as fresh as if just cooled. As animals cross these fields or pick their way among the knife-like edges of broken rock their hoof beats resound as on a metal pavement. On the upper slopes the lava is badly decomposed, forming a rich, though shallow, soil.

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[5] See the discussions of the problem in the several works referred to in footnote 4.

[6] Alexander Agassiz: Work cited in footnote 4, pp. 9-11.

[7] James Colnett: A Voyage to the South Atlantic and round Cape Horn . . . . London, 1798; reference on p. 143.

ERUPTIONS

There have been several eruptions recorded since the time the islands were discovered. In 1814, again in 1825, and again ten years later volcanic activity was noted in some of the western islands. In 1897 a new crater, on James Island, broke into violent activity, pouring enormous streams of lava down the mountain side. At times a glow may still be seen reflected from the opening made on that occasion. Though there has been no eruption observed on Albemarle for many years, the crater of Santo Tomás, one of its largest cones, contains many vents from which are constantly issuing jets of steam and gas. Other islands are deeply covered with flows of recent date. Wolf asserts that even the base of the islands is composed of an old volcanic tufa. Though sandstone had been reported along some of the coasts Alexander Agassiz determined this to be only decomposed fragments of coral cemented into rock. Coralline limestone is seen in places on the beach though no reefs are present nor do corals thrive in the surrounding waters, which are too cool to favor their existence. Deep sea dredgings have revealed an immense amount of silt that has been carried far out toward the Galapagos, an occurrence which also probably has served to check the growth of corals in this region.

PLANT AND ANIMAL LIFE

Conclusions regarding the origin of the islands are based as much upon the nature of the plant and animal life found there as upon the geologic structure of the group. To the traveler, unless fortunate enough to arrive during an unusually rainy season, the general aspect is weird beyond imagining.[8] Save for a narrow belt of mangrove trees that in places fringe the shore there appears nothing but a broad reach of jagged volcanic rock, its barrenness broken only by solitary stalks of tall, forbidding cactus, or scattered clumps of stunted, ash-colored shrubs whose leaves have shrunk to desert thorns. The few varieties of animal life encountered in this desert zone are no less strange. Sun-bleached shells of giant turtles dot the plains; occasional living specimens may be seen feeding upon the succulent cactus stems. Birds of a limited number of species, so tame they may be caught in one's hands or knocked down with a stick, swarm like flies within the belt of mangrove trees or sweep over the black plains in search of insects. The most common animal is the lizard, the small familiar kinds that dart from crevice to crevice among the rocks, the larger land variety generally found in caves among the blocks of lava, or the great, hideous, sea iguanas, some three or four feet in length, notable as being the sole surviving species of marine saurians from a bygone age. The entire scene is typical of the storied desert island: a fitting site for pirates' rendezvous; well named "The Haunted Isles."

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[8] Agassiz (whose visit in 1891 occurred during a year of famous rains on the islands and the corresponding mainland) remarks the contrast between the then green appearance and the desolate aspect described by Darwin (*op. cit.*, p. 61).

THE INTERIOR REGION

Going inland, across the barren plains one encounters a region in striking contrast to the arid coastal lands. The ground rises gently toward the interior. At about 500 feet above sea level there occurs a sudden change of conditions. The desert gives way to a flourishing growth of vegetation. Only a narrow belt of larger but still leafless trees marks the transition to this upper zone. Here a thick growth of forest is encountered, composed of trees not large but having an exuberant foliage, while creepers cross from tree to tree, and the ground is overgrown with beautiful ferns.

Above this forest belt and reaching, on some of the islands, to the extreme summits of the rounded cones extends a stretch of grasslands where herds of wild cattle and donkeys graze and fatten. Here too live giant galapagos, on islands where inroads of hunters have not exterminated them. The soil of these natural pastures is a clay, formed, as has been said, of lava decomposed by constant moisture and enriched with a deposit of humus that makes possible an abundant growth of grass; or, as on Albemarle, a surface bed of finely powdered pumice, which, though too porous to retain much water, has offered a foothold for the formation of a compact sod. Running water is scarce even upon these pasture lands; but the water table lies only a little below the surface, and drinking places have been excavated where the lay of the ground permits or where tiny springs emerge. To these drinking ponds the animals come from great distances. The cattle are able to go an unusually long time without taking water. The heavy mists that settle on the grass seem to supply their need. The turtles, also accustomed to drink but seldom, travel for miles to slake their thirst about the borders of the pools. With their slow pace they spend many days in reaching the water. After drinking their fill they lumber back to their wonted feeding grounds along the well-worn paths that radiate from each pond.

EFFECT OF ISOLATION ON ORGANIC LIFE

Of all the islands in the world none offers a better field to study the distribution of plant and animal life or the effect of an isolated environment upon organic forms. Of the 26 kinds of land birds described by Darwin all but one were peculiar to the Galapagos, while nearly 200 of the 400 species of plants that have been found are confined entirely to this group of islands. The great land turtles exist in no other place upon the globe. Here alone survives that strange saurian, the sea iguana to which reference has already been made. Only one species of native mammal has been found, a small rodent, likewise endemic, about the size of a rat. So distinct are both the fauna and the flora and so diverse on the different islands that they point to a long period of isolated development whatever the source from which they came.

PROBABLE ORIGIN OF FLORA AND FAUNA

The conclusions arrived at by Darwin and confirmed by Alexander Agassiz have been borne out in later research, that "its flora . . . . . is eminently American, while its fauna at every point discloses its affinity to the Mexican, Central, or South American, and even West Indian types."[9] In spite of the distance that separates them from the mainland the Galapagos Islands are well situated to receive contributions of plant and animal life from the continents. They lie at the meeting place of two ocean currents, both of which come directly from coasts that might contribute to this life. The Humboldt Current, during nine months of the year when the trades are blowing constantly, divides into two branches off the coast of Ecuador, the larger one veering westward towards the Galapagos. Its velocity is very great, sometimes as much as 75 miles a day; so that under favorable circumstances eight or ten days would suffice to carry drifting objects to the islands. From the northeast a warm current that has come down along the coast of Central America enters this same region. The meeting of the different streams produces what has been called "current doldrums," the current turning east or west, north or south, according to the direction of the wind. The fact that the current from the southeast is cold and that it flows along a desert coast where few streams enter the sea, while the northern current has a higher temperature and bathes a shore whose numerous torrents in the rainy season come laden with sediment, probably accounts for the greater resemblance of fauna and flora to those of Central America. The *Albatross* observers reported the ocean floor covered with decaying vegetable matter far out along this northern drift. This seems sufficient to explain the presence and the character of life upon the islands without presupposing a former actual land connection. Alban Stewart, after a year spent on the islands and a careful study of their flora, considers that the botanical evidence goes so far as to make a very positive argument against any former connection with the continent.

CLIMATE

The climate of the Galapagos is far from equatorial. The presence of cold water from the Humboldt Current reduces still farther the mild temperature to be expected in an oceanic climate. Darwin reported a temperature of 60° F. one foot below the surface on the southeast side of Albemarle, and Wolf records surface temperatures of 70° F. and 73° F. at several points between the islands. So marked is the effect of the cold current that, while the geographical equator passes directly through the group of islands the thermal equator lies some distance north, throughout many months departing over 20° of latitude from the geographical line.

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[9] Alexander Agassiz: *op. cit.*, p. 60.

This favors the development of strong southeast trades at the islands during most of the year. A further contributing influence to the cool temperature of the ocean in this region is probably found in the upwelling of cold water from the ocean depths.[10] These factors combine to make the Galapagos cooler than any other equatorial land at so near sea level. Even on the lowlands the heat is modified, but the effect of air currents from off a cool water surface is most striking as one ascends the slopes toward the interior.

The zones of vegetation already noticed find their explanation in the varying meteorological conditions that exist at different levels. Both in temperature and moisture is this difference notable. Though continuous records are lacking, the observations made by scientists at different seasons of the year give a fairly accurate idea of the climate. While near sea level the temperature often rises to 90° F. (even higher in places sheltered from the wind), Wolf found a fall of one or two degrees for every hundred meters of ascent. Upon the middle slopes some 400 to 600 feet above the sea the average temperature was less than 70° F. On the summit of the hill of San Joaquín in Chatham Island at an elevation given as 2,330 feet, he recorded a mid-day temperature of 57.2° F. during heavy mist and a strong southeast wind. There is little variation from day to day and no marked seasonal difference. A passing cloud, or the presence of a fog, produces greater change of temperature than do the seasons, while the greatest range occurs from day to night. After sundown it becomes actually cold on the higher hills, and travelers who pass the nights there in the open air huddle about their camp fires even during the milder months of the year.

The northern islands lie more within the influence of the warmer ocean waters from the Gulf of Panama, those toward the south receiving the full effect of the cold Humboldt Current. The low temperature of the ocean waters has made possible the occurrence of some forms of life rarely found outside the higher latitudes. Several kinds of seals are common, among them *Otaria australis,* found also on the coast of Peru and Chile and about the islands of Tierra del Fuego. Penguins, whose range is generally restricted to the coast of subpolar regions, are here found directly upon the equator; and the great albatross so common about Cape Horn has followed the cold current towards the north, nesting by hundreds upon the island of Hood.

RAINFALL AND MOISTURE

In amount of moisture the zones of elevation are still more marked. The lower levels are almost rainless. During the first four months of the year some showers may fall, but completely rainless years are not unknown. The nature of the soil is such that any water which may fall immediately disappears beneath the rock-strewn surface. Some who have visited the islands in unusual seasons have been surprised to find the lower lands green with vegetation; but in normal years there is a very serious lack of moisture.

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[10] Cf. R. E. Coker: Ocean Temperatures off the Coast of Peru, *Geogr. Review*, Vol. 5, 1918, pp. 127-135.

In contrast with the desert conditions characteristic of the slopes near the sea, the uplands are bountifully supplied with moisture. Besides a well-marked period of frequent convectional showers extending from February to May when the southeast trades are interrupted and equatorial calms prevail, there is a so-called summer, approximately from June to January, when, though the tropical downpours have ceased, the hills are drenched in dense mists (*garúas*) sufficient to keep the roads filled with mud, make books and papers mold in a short time, and quickly rust unpainted iron. Light rains may fall here at any season. On the southeast side of the islands, as on corresponding slopes of the hills, the moist zone extends several hundred feet lower, while the northern exposures, sheltered from the rain-bearing winds, present a striking contrast in their relatively arid character. The effect of abundant moisture on the uplands is evident not only in the ranker growth of vegetation but even upon the lava flows that stretch from near the summits to the sea. The upper sections of these flows are often badly weathered and covered with plants that have found lodgment upon their surfaces, while the lower reaches, that cross the arid zone beneath, show little effect of atmospheric action but lie in solid blocks of black obsidian. But for the constant humidity on the highlands the soil itself would still resemble that of the desert lower grounds.

Settlements

It is upon these high slopes that the few human settlements have been made. Only laborers required to handle cargoes live beside the landing places. On the island of Charles (Santa María of the Spaniards, Floreana of the Ecuadorians) Darwin found a penal colony occupied in the cultivation of corn, sugar cane, fruits, and many vegetables. The *hacienda* on Chatham island produces chiefly sugar, but its peon workmen raise also coffee, grains, and fruit. Hides and turtle oil, with sulphur from the crater of a volcano, form the principal products of the one estate on Albemarle. Its people are well supplied with beef or turtle meat and raise enough to provide for their own needs on the small patches of cultivated land. No other islands have been occupied. The lower ones possess no productive soils. There is estimated to be a total of about 200 square miles of land suitable for cultivation on all the islands. A somewhat greater area is available for pasture. The climate is found congenial by the Indians from the highlands of the Andes. They form the principal element in the population of Chatham, serving as peons upon its sugar estate. The only land occupied is held in these two large farms on Chatham and Albemarle. About them centers the entire life of the islands. Their respective owners hold a monopoly of the trade; to them belong the only vessels plying between the islands and the mainland. Ecuadorian officials, desirous of seeing the islands peopled by their own citizens, propose to grant free land to prospective settlers, advancing funds sufficient to equip them with the necessary implements for farming.

PROSPECTS

The Galapagos are not likely to become a purely agricultural colony. The restricted area of tillable soil makes that improbable. Other resources, however, may be developed. The giant turtles will supply oil and meat for a few inhabitants for some time to come. Their flesh is tasty. Dampier said of them, "they are large and fat, and so sweet that no Pullet eats more pleasantly." For this very reason they are already extinct on Chatham and would not long survive the general settlement of the islands. Contrary to what has been supposed there is little guano worth exporting and no metals can be expected, considering the volcanic structure of the rock. But stock raising and exploitation of such resources as sulphur, orchilla (the lichen producing the dye orchil or archil), and the marine life with which the ocean teems and which may be cured with the salt deposits of the islands, may supplement agriculture sufficiently to make a considerable population possible.

With the opening of the Panama Canal the islands gain an advantageous position. Their situation, once an obstacle to all progress, now becomes a valuable asset. Directly on the line of traffic from the Isthmus to New Zealand and Australia they offer an excellent site for coaling and provision stations.[11] Several well sheltered harbors on the western side of the islands are of easy access and afford good anchorage for vessels. While the currents are baffling and uncertain, no storms visit the group during any period of the year. The scarcity of water may be overcome. Though few surface streams have been discovered water can be found at little depth on the larger islands and some streams are known to enter the sea below the high tide level. Though it may be a consideration of little weight while they remain the property of Ecuador, the islands possess, too, great strategic importance because of their nearness to the world's new crossroads. In the hands of a naval power they would become of value as a base from which to guard the approaches to the Canal. But Ecuador seems reluctant to part with them and, in the hope of effecting their colonization and by maintaining closer intercourse with them, no doubt plans to profit from their enhanced importance along the coming lines of trade.

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[11] Paul Walle: Les îles Galapagos et le canal de Panama, *Bull. Soc. de Géogr. Commerc. de Paris*, Vol. 33, 1911, pp. 594-604.